

What is claimed is:

1. A frame number detecting device, comprising:

frame number detecting means receiving an input signal comprising a sector
 5 containing data of a plurality of frames, each said frame comprising frame number
 information recorded as a sync signal used to specify the number of said frame in said
 sector, said frame number detecting means detecting said numbers of said frames by
 using said sync signal of said input signal;

first and second counters which increment their count numbers in accordance
 10 with input of said sync signal, wherein when said count numbers have reached a given
 value, said first and second counters return said count numbers to zero and then
 increment said count numbers again in accordance with the input of said sync signal;

comparing means for comparing the value of said number of said frame read by
 said frame number detecting means and the value of said count number of said first
 15 counter to see whether the values agree with each other; and

state detecting means which causes a state variable to vary on the basis of the
 result of comparison made by said comparing means, wherein when said state variable
 satisfies a given condition, said state detecting means causes said first counter to change
 the value of said count number to the value of said number of said frame read by said
 20 frame number detecting means without incrementing said count number, and when said
 state variable satisfies another given condition, said state detecting means causes said
 second counter to change the value of said count number to the value of said count
 number of said first counter without incrementing said count number,

and wherein said frame number detecting device outputs the value of said count
 25 number of said second counter as said number of said frame.

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2. The frame number detecting device according to claim 1,
 wherein said sync signal comprises a plurality of types, and
 said frame number detecting means detects said numbers of said frames by
 5 using part of combinations of said types of said sync signal in successive two or more of
 said frames.

3. The frame number detecting device according to claim 2,
 wherein said frame number detecting means comprises,
 10 sync signal type detecting/encoding means for specifying said type of said sync
 signal and outputting said type in an encoded form,
 a latch circuit for latching an output from said sync signal type
 detecting/encoding means, and
 sync number encoding means for detecting a combination of variation of said
 15 types of said sync signal of successive two or more of said frames by using an output
 from said sync signal type detecting/encoding means or/and an output from said latch
 circuit, specifying said number of said frame by using said part of said combinations, and
 encoding said number of said frame.

20 4. The frame number detecting device according to claim 3, wherein
 said frame number detecting means further comprises converting means for
 converting said input signal into a plurality of pieces of parallel data having the same
 contents, and
 said sync signal type detecting/encoding means comprises,
 25 sync signal type detecting means comprising a plurality of detectors, said

plurality of detectors respectively receiving said pieces of said parallel data and specifying said type of said sync signal in said parallel data, and

sync signal type encoding means for encoding an output from said sync signal type detecting means and outputting the encoded type.

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5. The frame number detecting device according to claim 3, wherein said frame number detecting means comprises a plurality of said latch circuits.

6. The frame number detecting device according to claim 1, wherein said state
10 detecting means comprises,

an up/down counter receiving said result of comparison made by said comparing means, said up/down counter increasing/decreasing its count number in accordance with said result of comparison and outputting said count number as said state variable,

15 a first gate circuit composed of a combination of a plurality of gate circuits, said first gate circuit causing its output signal to go active when said state variable has reached a given value,

a second gate circuit composed of a combination of a plurality of gate circuits, wherein when said state variable has reached another given value, said second gate circuit
20 causes its output signal to go active and outputs said output signal to said second counter, thereby causing said second counter to change the value of said count number to the value of said count number of said first counter without incrementing said count number, and

a third gate circuit, wherein when said frame number detecting means has detected said number of said frame and the output signal of said first gate circuit has
25 become active, said third gate circuit causes its output signal to go active and outputs said

output signal to said first counter, thereby causing said first counter to change the value of said count number to the value of said number of said frame read by said frame number detecting means without incrementing said count number.

5 7. The frame number detecting device according to claim 1,
wherein said state variable can take at least three values, and
when said result of comparison made by said comparing means indicates a
mismatch, said state detecting means causes the value of said state variable to vary in an
increasing or decreasing direction, and when said result of comparison made by said
10 comparing means indicates a match, said state detecting means causes the value of said
state variable to vary in a direction opposite to the direction adopted in the case of said
mismatch,
and wherein said given condition is a condition in which said frame number
detecting means was able to detect said number of said frame and said state variable has
15 reached a given value, and
said another given condition is a condition in which said state variable has
reached another given value.

20 8. The frame number detecting device according to claim 1, further
comprising timing adjusting means for adjusting timing of operations of said frame
number detecting means, said first and second counters and said state detecting means by
using said sync signal.

25 9. The frame number detecting device according to claim 8, further
comprising,

sync signal detecting/securing means for detecting said sync signal and outputting a pulse corresponding to said sync signal, wherein when said sync signal is lacking, said sync signal detecting/securing means inserts an interpolating sync signal pulse, and

5 masking means for blocking the output of said pulse for a given period after said sync signal detecting/securing means has outputted one pulse.

10. The frame number detecting device according to claim 9, wherein said masking means comprises,

10 edge detecting means receiving said pulse outputted from said sync signal detecting/securing means, for detecting an edge of said pulse,

 a counter which, when receiving an output of said edge detecting means, outputs another pulse having a larger pulse width than said pulse and then ceases outputting said another pulse until certain times of clock have been inputted even if
15 supplied with said output of said edge detecting means, and

 an AND gate receiving said pulse and said another pulse as its inputs.